

Claims

1. An injection apparatus (1) in a cold chamber die casting molding machine, which supplies molten metal of light metal material into a material supply mouth (21h) of an injection sleeve (21) and has a plunger injection device (20) which injects said molten metal by a plunger (22), comprising:

(a) a melting device (10) which melts said light metal material, and

a molten metal feeding member (15) which pours molten metal from said melting device to said plunger injection device;

(b) wherein said melting device further includes,

a billet supplying device (40) which replenishes the molding metal by supplying said light metal material in the form of a billet (2) of the short cylindrical rod shape,

a billet inserting device (50) which is situated behind said billet supplying device and has a pusher (52a) for moving said replenished billet forward or for retreating the distance which exceeds overall length of said billet, and

a melting cylinder (11) which is situated in front of said billet supplying device for accommodating said plural billets moved forward by said pusher and for melting from the front end of said billets so as to form several shots of molten metal (3);

(c) wherein said molten metal feeding member further includes a material supplying hole (15a) for pouring said molten metal from the front end of a cylinder bore (11a) of said melting cylinder to said material supply mouth of said injection sleeve; and

(d) wherein said melting device measures said molten metal by pushing said billet via said pusher and by supplying one shot of said molten metal into said injection sleeve after said plunger injection device makes said plunger retreat.

2. The injection apparatus in a cold chamber die casting molding machine as defined in claim 1, wherein said melting cylinder of said injection apparatus is composed by such a first melting cylinder (111) that most of a cylinder bore (111b) except for base side of said first melting cylinder is formed to have an inside

diameter which keeps said most of the cylinder bore into contact with an enlarged side surface (2a) of not-yet-melted front end of said billet with the degree which prevents the backward flow of said molten metal, and a cylinder bore (111c) of said base side of said first melting cylinder is formed to have a little larger diameter than an outside diameter of said billet.

3. Said melting device of said injection apparatus in a cold chamber die casting molding machine as defined in claim 1 comprising:

(a) a cooling member (214) which cools said billet,

a second melting cylinder (211) which is fixed in front of said cooling member, and

a cooling sleeve (212) which is situated between said second melting cylinder and said cooling member;

(b) wherein said cooling member has a through hole (90b) with a diameter a slightly larger than the outside diameter of said billet and has a cooling duct (90d) around said through hole;

(c) wherein most of the cylinder bore (211a) of said second melting cylinder is formed to have an inside diameter which does not allow said most of the cylinder bore to come into contact with said front end of said billet; and

(d) wherein said cooling sleeve has a circular groove (212a) which generates a circular solidified material (201) of said molten metal on the periphery of said billet by cooling said molten metal.

4. The injection apparatus in a cold chamber die casting molding machine as defined in claim 1, wherein said material supplying hole of said molten metal feeding member of said injection apparatus leads to said cylinder bore of said melting cylinder via a connecting passage (13b) that is opening at the upper portion of said cylinder bore of said melting cylinder and said melting cylinder is arranged in the inclined posture in which the front portion is high position.

5. The injection apparatus in a cold chamber die casting molding machine as defined in claim 1, wherein such an opening and shutting device (70) is provided between said melting device and said plunger injection device, that contains a valve rod (71) for opening and shutting the bottom end of said material supplying hole by going up and down in said material supplying hole, and a valve rod driving device (72) for opening said valve rod only at the time of measuring.

6. Measuring method used in said injection apparatus in a cold chamber die casting molding machine as defined in claim 5, wherein said molten metal is measured in such a manner that said molten metal is always stored in said material supplying hole with the opening and shutting operation of said material supplying hole and the extruding operation of said pusher performed almost simultaneously.